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AUTHOR'S EDITION.

DEPARTMENT OF THE INTERIOR.
UNITED STATES GEOLOGICAL AND GEOGRAPHICAL SURVEY.
F. V. HAYDEN, U. S. Geologist-in-Charge.

NEW MOTHS,

WITH A PARTIAL CATALOGUE OF NOCTUÆ;

AND

NEW MOTHS, PRINCIPALLY COLLECTED BY MR. ROLAND THAXTER, IN MAINE,

WITH NOTES ON NOXIOUS SPECIES AND REMARKS ON CLASSIFICATION.

BY

A. R. GROTE.

EXTRACTED FROM THE BULLETIN OF THE SURVEY, Vol. VI, No. 3.

Washington, August 30, 1882.

Art. XIX.—New Moths, with Partial Catalogue of Noctuæ.

By A. R. Grote, A. M.

From the tender green of the young grass in spring time, to the ard and brilliant red of the autumn leaf, the moths carry upon their ings nature's palette, full of colors the most various and beautiful. ike flying flowers, stem-forsaking when the sun takes the day from e circling earth, they haunt the darkness with unquiet wings. The uman mind dwells with pleasure, from an æsthetic point of view, upon eir various tints and forms. As objects of scientific inquiry, they are teresting for the curious changes they undergo and for their structure d habits. In studying their distribution we find that they depend pon soil, vegetation, and climate, and that they even suggest and con- m observations made upon the probable past condition of the earth's rface by their presence in particular localities. The importance of udying them is not diminished by their frail appearance and brief es. Indeed, they have additionally attracted a class of writers whose inds seem to be fitted for very different occupation, and it is to be ped that they may even succeed in giving a fresh illustration of the iry tale of Beauty and the Beast.

TRIPUDIA BASICINEREA n. s.

Head, thorax, and base of fore wings gray. Primaries washed out, rdly, beyond the middle, with light leather brown. A media curved. oad, velvety black line, broken above. Reniform round, concolorous, a tle paler brown. Subterminal line irregular, waved, fuscous. A dark own terminal line. A pale line at base of blackish fringes. Costal ts. Hind wings pale fuscous; beneath stained with ochery, with uble, vague, common lines. Arizona, B. Neumoegen. *Expanse* 20 l.

Larger than the two other species *quadrifera* of Zeller and *flavofasci-* of Grote. The latter is probably described recently by Mr. Hy- dwards as *Oribates versutus*.

EUCLIDIA INTERCALARIS n. s.

♀. Gray, dusty, color of *erechtea*. Fore wings with four median tri- nate black patches separated by the veins, and a median gray shade

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broadening below where it joins the pale, even t. p. line which is nea the margin. Subterminal line even, pale, near the margin. On s. t field two or three costal black dots and a black line above interna angle. A black dash on internal margin near the base. Hind wings fuscous gray, with two exterior pale lines. Body gray. The median vein and the spaces between veins 3 and 5 on median space of primaries shaded with gray. Beneath gray without markings.

New Mexico, Professor Snow, No. 874. *Expanse*, 31 mil. The four median black patches are unequal in size and shape.

PYRRHIA Hubner.

Dr. Speyer is with myself of opinion that this is a valid genus, the species differing decidedly from *Chariclea*, in vestiture and armature. While there is but one European species, we have three from the territory east of the Rocky Mountains. These are: *Exprimens* Walker (Bull. B. S. N. S. II, pl. III, fig. 5), which seems to stand nearest the European form; *Angulata* Grote (*id.* loc. fig. 6), which has been comparatively described by Dr. Speyer under the name of "Exprimens"; and *Stilla* Grote (North American Entomologist I, 45), which is the largest, handsomest, and most intensely colored. The pattern of ornamentation is the same in all four forms, while our two species of *Chariclea*, Triangulifera, and Pernana, have a very different style of marking and exactly follow the European type of the genus, *Delphinii.*

EULINTNERIA n. g.

The neuration is given, Trans. Am. Ent. Soc., 1872, 106. Male with a cut in the primary wing on outer margin; female with entire wings. Male antennæ simple, ciliate; palpi three times as long as the "front," curved upwards. Ocelli present. "Front" flat. Eyes naked and legs unarmed, as always in the Deltoids. Professor Lintner suggests that our species does not belong to Tortricodes, and, in this opinion, I name the genus for him. Type: *Tortricodes bifidalis* Grote.

Geometridæ.

EUCATERVA VARIARIA Grote.

This geometrid genus and species, which I have elsewhere characterized, I again call attention to on account of the difference in the length of the male and female labial palpi. In both sexes they are longer than usual in the group, in the male, longer, curved, projecting upwards and forwards, linear, closely scaled, ringed black and white. In the female, similar in appearance, shorter, pointed, and perhaps slenderer. The body is rather stout; the female abdomen thick and vermiform. Th species seems to be allied to *Caterva catenaria*, a species I am unwillin to refer to *Zerene*, but which Dr. Packard has characterized under thi name, which belongs to a European species, differing structurally in my opinion. *Catenaria* is numerous in the fall as a moth, and has been mistaken for the white cabbage butterfly by unskilled observers. It is a pretty moth; the larva feeds on weeds not of economical importance. *Eucaterva variaria* is smaller, more like *Cleora pulchraria* in size. The male is white, speckled, and clouded with fuscous, the dark shades forming two mesial bands on the forewings, which leave the costal region white and freer from black speckles. The outer blackish band is straight; the inner curved. There is a black discal mark. Singularly enough, as I have stated, there are two varieties of the female. The male antennæ are feathered, the female simple. One of the varieties is white with black dots sparsely and irregularly displayed, massing a little on exterior border, and with the fringes (as in the male) black dotted. The other form has a black shade extending over primaries, leaving the costal region white, as also the inner margin. The body is white. There are no ocelli. The female antennæ fine and blackish. The white thorax shows some black speckles, especially on the collar. This Arizonian insect, taken at Tucson, and of which Mr. Neumoegen's collection contains many examples, is one of the most interesting Geometrids recently discovered.

The following are the additions to our list of the North American species of *Agrotis* given in Bull. U. S. Geol. Surv. vol. vi, No. 1:

Pastoralis Grote, Can. Ent. 7, 68. Vanc.; Colo.; Arizona.
N. B.—Accidentally omitted from the former list.
uarta Grote, Bull. U. S. Geol. S., vi, 258. California.
ashingtoniensis Grote, Bull. U. S. Geol. S., vi, 259. Washington Ter.
mmixta Grote, Bull. U. S. Geol. S., vi, 259. Texas.
ocilis Grote, Bull. U. S. Geol. S., vi, 259. Colorado.
iralis Grote, Bull. U. S. Geol. S., vi, 260. Nebraska.
emiclarata Grote, Can. Ent. 13, 132. Washington Ter.
olata Grote, Can. Ent. 13, 131. Oregon.
surialis Grote, Can. Ent. 13, 131. Washington Ter.
analis Grote, Can. Ent. 13, 131. Nevada; Montana.
epentis G. and R., Trans. Am. Ent. Soc. 1, pl. 7; *Agr. Cochranii* Riley. Eastern and Middle States to California.
N. B.—This must be a distinct species from *Messoria* of Harris, as have shown Papilio 1, 126.
essoria Harris, Ins. Inj. Veg. 1st ed. 324. "Massachusetts."
avilæ Grote, Papilio 1, 76; Butler, *id.*, 169. California.
N. B.—I have shown that this form is most probably distinct from ur eastern *Clandestina*.
lodiana Grote, Papilio 1, 76. Washington Ter.

I append here the descriptions of Guenée's under *Agrotis*, not recognized by me, in the hope that it may lead to the identification of the species.

Agrotis spissa Guen., Noct. 1, 261.

This greatly resembles *Crassa*, but the species is smaller (35 mil.), of a grayish-brown testaceous, the veins darker and relieved by a slightly paler ground, especially the median and its last branch; markings like *Crassa*, but there is a great disproportion between the two stigmata; the t. p. line forms a dash entering below the fourth inferior nervule; and on the inner margin, below the submedian vein, it is elongated in such a way as to touch the top of the mark formed by the extra-basal line; the cuneiform marks of the s. t. line are more regular and more equal; the hind wings are darker and more uniform.

Am. Sept. Coll. Bdv. Two bad specimens.

Noctua ochrogaster Guen. Noct. 1, 237.

A little larger than *plecta*, which it resembles in markings. The red of the primaries is paler, the subterminal is well marked by a deep blackish shade. The terminal dots are rounded and separate; the fringe is cut by a dark line; the stigmata are larger; the reniform less constricted, and the median vein is equally white. The hind wings have a very distinct series of rounded terminal dots. The collar is ochery white, as also the abdomen, which is without any reddish anal tuft.

Am. Sept. Coll. Bdv. One male.

Noctua elimata Guen., Noct. 1, 333. 40 mil.

Fore wings pale ashen, much mixed with pale violaceous red, all the lines visible, of the former color, preceded and separated by shades of the latter tint, especially the subterminal line, which is very sinuous and irregular; the t. p. line is denticulate; the t. a. line forms three large teeth, all marked on costa by a deep brown mark. The two stigmata well defined, pale, separated inferiorly by a dark line; the orbicular contiguous to the t. a. line; the reniform large and regular, the terminal space ashen. Hind wings of a uniform dark gray with the fringe paler and more reddish. Beneath the four wings are reddish. Antennae of the male strongly pectinate. Female larger but similar. Georgia. Coll. Doubleday. Caterpillar having nearly the same colors as the moth, that is to say, the dorsal region and subdorsal are reddish, the lateral ashen, without well defined lines, and only showing some slightly darker subdorsal markings. Head ocher yellow. Collar dark brown. Feet concolorous. Abbot represents it on chrysanthemum. Chrysalis light red, with the membrane covering the wings mixed with greenish.

Agrotis tesselloides n. s.

This is the Californian representative of *tessellata*; of this latter I am indebted to Professor Lintner for a series of nine selected specimens showing its range of variation. Six specimens of *tesselloides* agree among themselves and differ by the paler, more purply gray tint of th primaries without black shading on cell (as to which *tessellata* varies) and the hind wings are of a more uniform tint throughout. The gray, discolorous stigmata are smaller, the transverse lines more distinct, the t. a. more waved. A single specimen differs by the very large stigmata, the orbicular lying over costal region to edge, the median shade marked on cell, the collar dark in front; it may be a distinct species. *Tesselloides* is the same size as its Eastern ally, and Mr. Edwards's number for the Havilah specimens is 6513. The variety is numbered 6544.

Agrotis pellucidalis n. s.

This form is closely allied to *rudens*, but differs by the absence of the longitudinal black dashes on fore wings. Hind wings pellucid white. Head and base of collar ochery. Fore wings pale brownish, with the markings in blackish fuscous. T. a. line black, interrupted, perpendicular, with the concolorous clariform faintly outlined attached. Half line double, black, divided by a diffuse pale shade in the middle. T. p. a double series of black venular dots, the inner series partially connected by a dentate black line. Reniform with an interior fuscous black solid lunule. Costa dark shaded. Terminal space dark, intruding twice on the pale ground color, opposite cell and again about internal angle. A dark costal mark before s. t. line. Fringes dotted with fuscous. *Expanse*, 30 mil. *Hab.*—Texas.

The relationship of this smaller species with *annexa* and *malefida* is evident. The color of the head is not uniform in the two specimens before me.

I have given, in the last volume of this bulletin, an extract from the new list of North American Noctuidæ on which I am at work. I here correct that and continue to the genus *Apatela*. This latter genus will undoubtedly be found to include diverse types as soon as the larva are known and studied in connection with the perfect insect. I have given, in the Bulletin of the Buffalo Society of Natural Sciences, vol. 1, p. 78, an outline of some of these divisions. We shall probably use *Triæna* for the type of *psi*, *occidentalis*, *tritona*, *grisea*, *lobeliæ*, etc.; *Acronycta* must be used for species congeneric with the European *leporina; Megacronycta* for *Americana; Apatela* for species congeneric with the European *aceris; Lepitoreuma* for our *ovata* and allies, *Jocheæra* for *funeralis*, while *Eulonche* must be used for *oblinita*, *lanceolaria* and *insolita.* To this latter group *xyliniformis* and *edolata* are related. Other types will be probably afforded by *spinea*, *innotata*, and *brumosa.* I do not agree with Mr. Butler that any of these insects are *Bombycidæ;* the larvæ affect Bombycidous types, but I believe that in this group the free embryonic stages have submitted to independent variation, while the gray colors and habits of the perfect insects have proved sufficiently useful to be conserved. Before this division can be made, comparison with European forms must be entered on and decided characters in the moths must be discovered.

I have recently again catalogued the N. Am. *Bombyciæ* (which precede the *Nonfasciatæ*) in the pages of the "Canadian Entomologist," and either in this magazine or the "Bulletin of the U. S. Geol. Survey," or in "Papilio," I have given lists of the principal genera of *Nonfasciatæ*, so that there is a good deal of material on hand for the issuance of the New List of the Family. Such genera catalogued by me are, for instance, *Oncocnemis*, *Hadena*, *Mamestra*, *Polia*, *Agrotis*, *Plusia*, *Graphiphora*, *Eustrotia*, *Spragueia*, *Thalpochares*, *Tarache*, etc. In the list of *Agrotis* (Bull. U. S. Geol. Surv. 6, p. 158) there should be a section sign (§) after *digna*. This list, while as complete as I could make it, is not intended as the best with regard to the *arrangement* of the species; the only name I have been able to find omitted is *pastoralis*.

NOCTUÆ Linn.

NONFASCIATÆ Borkh.

DICOPINÆ.

In this section are grouped genera with the head sunken, squamation rough or thick, male antennæ pectinate, legs unarmed except fore tibiæ, which have a stout claw, eyes naked, labial palpi short, ocelli present. The species appear usually early in the year; the chrysalis hibernates.

EUTOLYPE Grote (1874).

Rolandi Grote, Proc. Acad. Nat. Sci. Phil. 198, 1874; *Copipanolis vernalis* Morr. P. B. S. N. H. 133, Dec. 1874. Eastern States to Texas.

DICOPIS Grote (1874).

Muralis Grote, 6th Ann. Rep. Peab. Acad. Sci. 27. Eastern States to Texas.

Electilis Morr. Pr. Bost. S. N. H. 115, Oct. 1875. Penn. The type is in Mr. Tepper's coll.; it seems very close to *Muralis*, but I have not compared the two.

Thaxterianus Grote, Bull. B. S. N. S. 2, 196. Massachusetts; Texas.

Damalis Grote, Bull. U. S. Geol. Surv. 5, 208. California.

Depilis Grote, Papilio, 1, No. 4. Massachusetts; Ohio.

COPIPANOLIS Grote (1874).

Cubilis Grote, 6th Ann. Rep. Peab. Acad. Sci. 30. Eastern States to Texas.

BOMBYCOIDEA.

AUDELA Walker.

Acronyctoides Walk., Can. Nat. Geol. 6, 37; Grote, Can. Ent. 9, 27; *Panthea leucomelana* Morr. Proc. Ac. N. S. Phil. 428, 1875; Grote, B. U S. G. Surv. 4, 169. Canada; Western N. Y.; Maine.

PLATYCERURA Packard (1864).

Furcilla Pack., Proc. Ent. Soc. Phil. 374, 1864. Larva on White Pine, Lintn. Ent. Con. 3, 131, with figure. Canada; Eastern and Middle States.

CHARADRA Walker (1865).

Propinquilinea Grote, Trans. Am. Ent. Soc. 4, 293, pl. 1, fig. 96; Goodell. Papilio, 1, 15. Eastern and Middle States; larva on the White Birch and Walnut.

Deridens Guenée, Noct. 1, 35, pl. 3, fig. 8; *Acronycta circulifera* Walk., 709; *Charadra contigua* Walk. Sup. 446; G. & R. Trans. Am. Ent. Soc. 2, 86; Lintn. Ent. Con. 3, 157 (larva). Canada to Southern States. Larva on Oak (Thaxter).

Dispulsa Morr. Proc. Bost. Soc. N. H. 213, 1875. Texas.

Palata Grote, Can. Ent. 12, 258; ♀ Papilio, 1, 153. Colorado; Arizona.

RAPHIA Hübner (1816).

Abrupta Grote, Proc. Ent. Soc. Phil. 2, 336, pl. 8, fig. 3, 1863. Eastern and Middle States.

Frater Grote, Proc. Ent. Soc. Phil. 2, 435, pl. 9, fig. 7, 1864; *Saligena personata* Walk. Sup. 606 (1865). Eastern and Middle States. Larva on Poplar (Thaxter).

FERALIA Grote (1874).

Jocosa Guenée, Noct. 1, 37; Grote, B. B. S. N. S. 2, 58. Eastern and Middle States. Varies by being suffused with black.

MOMAPHANA Grote (1875).

Comstocki Grote, B. B. S. N. S. 2, 59; Stett. Ent. Zeit. 195, 1875. New York; Buffalo, collected by Prof. Kellicott.

DIPHTHERA Hübner.

Fallax H.-S. Exot. 80, fig. 211. Eastern, Middle, and Southern States.

HARRISIMEMNA Grote (1873).

Trisignata Walk., C. B. M. Noct. 29; *Notodonta sexguttata* Harris in Ent. Cor. pp. 174–5, figs. 24–5. The curious larva, with long thoracic hairs, and a habit of vibrating the body, from which it is called the "zig-zag" caterpillar, lives on lilac, and bores into wood to pupate, covering up the orifice by which it entered, so that it is not noticed. Canada to Middle States.

CERMA Hübn. (1818).

Cora Hübn., Zutr. 14, figs. 59, 60. Canada to Georgia. Is this Guenée's *Chariptera festa?* Guenée does not know this; he makes *hebraea* the type of *Grammophora*, but thinks *cora* may prove congeneric, and so includes it. *Grammophora* falls before *Polygrammate* according to the rule of priority. The difference seems to me unessential between this and *Bryophila*, but *Cerma cora* and *Harrisimemna trisignata* are structurally distinct and differ from *Bryophila* or *Polygrammate*. The dark lines on the paler ground of the primaries give rise to the idea of relationship, which has caused authors to use *Grammophora* in a wide and loose sense. I do not see how the term can be retained for any species, but if used it must be at the expense of Hübner for his species. Walker incorrectly referred *trisignata* to it, a moth whose habits, larva, and structure are quite peculiar, and unlike any other member of the group. Harris called the species a Notodontian; his name, though given earlier, was not issued until after Walker's, in his posthumous papers. I have named the genus after him, and to still further ally his name with the insect, which he was the first to at all adequately observe, I propose to call the species *Harris's Zigzag moth*, in the vernacular.

POLYGRAMMATE Hübn. (1816).

Hebraicum Hübn. Zutr. 1, 10, figs. 25–6; *Grammophora hebrœa* Guen., Noct. 1, 30, pl. 3, fig. 5. Middle States.

MICROCOELIA Guen. (1852).

Fragilis Guen., Noct. 1, 34. Canada to Middle States.

Diphteroides Guen., Noct. 1, 34; Grote, Proc. Ent. Soc. Phil. 3, 78, pl. 2, fig. 2; G. & R., Tr. Am. Ent. Soc. 2, 195, pl. 3, fig. 69.

var. *Obliterata* Grote, Proc. Ent. Soc. Phil. 3, 79; G. & R., Tr. Am. Ent. Soc. 2, 195, pl. 3, fig. 70. Canada to Alabama.

BRYOPHILA Tr.

Lepidula Grote, 6th Ann. Rep. Peab. Ac. Sci. 27. Canada to Middle States.

† *Corticosa* Guen., Noct. 1, 30.

"Size of *glandifera*. Fore wings dense, squamous, varied with greenish white, light brown and black, and the lines all black. Basal space of the first color, with the half-line and a spot on internal margin black. Median space brown gray, slightly mixed with fulvous (fauve) on the disc; terminal space white, spotted with brown. Subterminal line very black, and very much waved, and nearly parallel with the transverse posterior line. Fringe whitish, cut with black marks. Hind wings nacreous white, with a blackish shade commencing at anal angle and hardly reaching over half of the border. Abdomen white beneath. Body rather stout. Antennæ long. Two specimens. Coll. Bdv. Am. Sept." This description, which I have translated, will not apply to any form known to me. It is opposed to *lepidula* both in color and markings of fore wings and color of hind wings.

Teratophora H.-S., Exot., fig. 213; *Erastria inscripta* Walk., C. B. M. Noct. 808. Canada to Middle States.

Nana Hübn., Zutr. 1, figs. 53–4. "Georgia."

CHYTONIX Grote (1874).

Palliatricula Guen., Noct. 1, 26. Canada to Middle States.

Iaspis Guen., Noct. 1, 209; Grote List, 14. Same localities as *Palliatricula*, of which it may be the ♂ or a varietal form; notwithstanding Guenée's separation the two are closely allied.

Sensilis Grote, Papilio 1, 49. Eastern and Middle States. This genus is more robust and hadeniform than *Bryophila*, the body tufted; the thoracic scales are flattened, not like *Hadena* in this respect. It is peculiar from the white dot attached to t. p. line, in *Palliatricula* absorbed by the white shade of median space.

APATELA Hübn., Tentamen.

§ *Triæna* Hübn. (1816).

Occidentalis G. & R., Proc. Ent. Soc. Phil. 6, 16. Canada to Southern States. Represents in our fauna the European *Psi;* the larva has been described by Mr. Saunders, and is quite distinct.

Morula G. & R., Tr. Am. Ent. Soc. 2, 196, pl. 3, fig. 75; Lint. Ent. Con. 3, 137 (larva). Apple. Canada to Middle States.

Lobeliæ Guen., Noct. 1, 44; Coquill., Papilio 1, 6 (larva). Burr Oak. According to Guenée, Abbot represents the larva on *Lobelia*. Guenée describes from specimens, and his description agrees with our species, but not the larva. Texan specimens are large, and sometimes with a faint ocher tinge to the primaries. This is the largest of the group, but not so stout as *Americana* and allies. Canada to Texas.

Thoracica Grote, N. Am. Ent. 1, 94. Colorado.

Furcifera Guen., Noct. 1, 44. Middle and Eastern States.

Hasta Guen., Noct. 1, 45. Middle and Eastern States.

† *Telum* Guen., Noct. 1, 45.

"This resembles the two preceding species, but is more oblong, and the markings of the hind wings below is very different. 45 mil. Fore wings narrow, oblong, produced at apices, of an ashen gray much obscured by powdering, the median lines separate, fine, the stigmata tied and only well marked inferiorly. The fringe neatly cut. Hind wings of a very dirty whitish gray, a little iridescent, the margin and the veins much stained with black, beneath of a slightly nacreous white, with a basal dash, a strong cellular spot, a thick interrupted line, and distinct terminal dots, all black. One male. Am. Sept." I do not identify this description.

† *Spinigera* Guen., Noct. 1, 45.

"Shape and appearance of *Furcifera*. Fore wings of an ash gray powdered with blackish, with the markings indeterminate. Basal line very fine and joining the extra-basal. Orbicular small, rounded. Reniform very large, soiled with blackish. T. p. line well marked, denticulate, black, fine, but shaded largely although vaguely with brownish; a series of small terminal points. Fringe hardly cut. The inferior transversal dash running to a fine point but more visible than the rest. Hind wings of a yellowish gray, nearly concolorous, beneath yellowish white, with a discoidal line and the lunules little marked. New York. Coll. Doubleday. Two males in bad condition, which perhaps renders the above description incomplete." In collections the name "*Spinigera*" is attached to specimens which are probably the same as *Pallidicoma*, which has the t. p. line denticulate, but acutely so, and shaded with white, and belongs to a different group from this which Guenée puts in his genus *Semaphora* the equivalent of *Triœna*.

Tritona Hübn., Zutr., 107–'8; Guen., Noct. 1, 42. Canada to Southern States.

Falcula Grote, Can. Ent. 9, 86; Coquill., Papilio 1, 6; Larva on hazel. This is distinguishable from *Tritona* by the bright brown edging of the thoracic tuft behind; the dash at internal angle does not cross or indent the transverse posterior line. In this it resembles *parallela*.

Grisea Walk., C. B. M. Noct., 56; ? *pudorata* Morr., Ann. N. Y. Lyc. 93, 1875. Canada to Middle States. Mr. Morrison thinks that Guenée's *tritona* may not be Hübner's. His description of *pudorata* agrees fairly with *grisea* as determined from notes of mine on the B. M. Coll. There is some variation probably in tone of secondaries, for Mr. Morrison calls the hind wings of *tritona* "yellow." My specimens have the wings different shades of fuscous, with, perhaps, a faintly yellowish tinge.

Parallela Grote, Can. Ent. 9, 53. Colorado; Texas.

Albarufa Grote, Proc. Bost. Soc. N. H., 239, 1874; *Walkeri* Andrews, Can. Ent. 9, 98. Eastern and Middle States.

† *Interrupta* Guen., Noct. 1, 46; Am. Sept. This is described with the caterpillar from a drawing of Abbot's. It would be a good thing if the drawings (which I believe are either in Boston or in the coll. British Museum), which have been made the basis of descriptions by Guenée, could be published. I hardly think the species can be recognized without such help.

Vinnula Grote, Proc. Ent. Soc. Phil. 2, 436, pl. 9. fig. 2. Canada to Middle States.

Paupercula Grote, Proc. Acad. N. S. Phil. 197, 1874. Texas.

§.

Harveyana Grote, Proc. Ac. N. S. Phil. 418, 1875. Middle States.
Clarescens Guen., Noct. 1, 54. Eastern and Middle States.
Connecta Grote, Bull. B. S. N. S. 1, 79. Middle States.
†*Longa* Guen., Noct. 1, 54.

§.

Innotata Guen., Noct. 1, 50; *Graefii* Gr., P. E. Soc. Phil. 2, 68, pl. 3, fig. 6. Eastern and Middle States.

§.

Dentata Grote, Can. Ent. Canada; Eastern States.

§.

Radcliffei Harvey, Bull. B. S. N. S. 2, 270. Eastern and Middle States.

§.

Quadrata Grote, Bull. B. S. N. S. 2, 154. Missouri; Nebraska. Mr. Dodge has, I believe, reared this fine species from the larva.

§ *Acronycta* Ochs. (1816).

Tota Grote, N. Am. Ent. 1, 10. Texas.
Felina Grote, Bull. U. S. Geol. Surv. 5, 208. California. Mr. Hy. Edwards probably describes the larva of this on p. 5 of his No. 16, found on Poplars.
Lepusculina Guen., Noct. 1, 46; *Populi* Riley, 2d Mo. Rep., 119 (larva). Middle and Western States.

§ *Megacronycta* Grote (1873).

Americana Harris, Ins. Ing. Veg. 1st ed. 317; 3rd ed. 435; *hastulifera* Guen., Noct. 1, p. 47. Harris describes the larva on elm, chestnut, and maple. Prof. Riley also describes it, and his description agrees well with Harris's. This larva agrees fairly with that figured by Abbot and Smith as identical with the European *Aceris* on pl. 93. I refer the student to Bull. Buff. Soc. Nat. Sci. 1, 154, for a discussion of the probably correct synonymy. What species is intended by Abbot under *hastulifera* is not known. Coquillett describes the larva of *Americana* found on Red Oak, Papilio 1, 6. Guenée's name *acericola* is based on the figure of the imago given by Abbot on pl. 93. Perhaps the larva varies, but it is strange if Abbot's two plates of *hastulifera* and *aceris* represent the same species. The imago which Abbot calls *hastulifera* looks in the figure like *Americana*, but the caterpillar does not agree with our descriptions.

Dactylina Grote, Proc. B. S. N. H. 16, 239. Canada to Middle States. This fine species is undoubtedly distinct from *Americana;* the hind wings of the female are white.

Insita Walk., C. B. M. Noct. 61. Eastern and Middle States. This is also a large species with the hind wings white in both sexes. The fore wings are also quite white; the dash at internal angle is variable as in *Americana.*

§. *Merolonche* Grote.

Spinea Grote, Bull. B. S. N. S. 3, 78, pl. 4, fig. 7. California. The egg and young larva are described by Mr. Hy. Edwards, p. 3 of his No. 26. This is a paler and slightly more compact species, head closely applied to the globose thorax, than *lupini*, from which it differs by the t. p. line being a little drawn in opposite the cell and a dash on median space crossing the shade on submedian fold.

Lupini Behr Ms., Grote, Bull. B. S. N. 1, 79; 3, pl. 4, fig. 10. California. This species is of a dark blue gray, the t. p. line more dentate and without the pale mark at internal angle and the submedian dark dash of *spinea.*

§ *Apatela* Hübn.

Rubricoma Guen., Noct. 1, 48. Western and Southern States. Guenée describes the larva, from an unpublished drawing, on a species of "*Rhus.*"

Luteicoma G. & R., Tr. Am. Ent. Soc. 3, 179, pl. 2, fig. 83. Western and Middle States.

Pallidicoma Grote, Bull. U. S. Geol. Surv. 4, 169. Eastern and Middle States.

§.

Brumosa Guen., Noct. 1, 52; *Verrillii* G. & R., Tr. Am. Ent. Soc. 3, 178, pl. 2, fig. 82. Canada to Middle States.

Distans Grote, Can. Ent. 11, 38. Canada.

Subochrea Grote, Bull. B. S. N. S. 2, 153. New York; Canada. I have taken several specimens of this fine species near Buffalo, in June.

Superans Guen., Noct. 1, 53. Eastern and Middle States.

Persuasa Harvey, Bull. B. S. N. S. 2, 271. Eastern States to Texas.

Perdita Grote, Can. Ent. 6, 154. California.

Afflicta Grote, Proc. Ent. Soc. 2, 438, pl. 9, fig. 4. Middle to Southern States.

Noctivaga Grote, Proc. Ent. Soc. 2, 437, pl. 9, fig. 3. Canada to Middle States.

Jochœra Hübn. (1816).

Funeralis G. & R., Proc. Ent. Soc. Phil. 6, pl. 4, fig. 10; *americana* Harris in Ent. Cor. 313, pl. 3, fig. 3 (larva); Lintn. Ent. Con. 3, 135, larva on Elm. This species represents the European *alni* in our fauna. The name *americana* is posthumous and of later date than *funeralis;* it is besides used for another species.

§*Lepitoreuma* Grote (1873).

Ovata Grote, Bull. B. S. N. S. 1, 80, pl. 2, fig. 14. Eastern and Middle States.

Exilis Grote, Proc. Acad. N. S. Phil. 197, 1874. Middle States.

Hamamelis Guen., Noct. 1, 52; Goodell, Can. Ent. 9, 61. Larva on Chestnut. Guenée gives the larva on *Hamamelis Virginiana.* His description is comparative with *Rumicis.* This species varies very much in color and somewhat in size. I have examined a very large series, but without finding intermediate specimens between it and the dark and smaller *increta* or the pale and still smaller *dissecta.*

Haesitata n. s.

Two specimens from Pennsylvania are as large as the largest *Hamamelis*, and differ by the primaries being of a purely dull and pale bluish gray without any admixture of yellowish or olivaceous. The usual dark shading on sub-basal and subterminal spaces is reduced to a minimum. The hind wings are very dark. The dash at base of primaries is reduced. This form is easily recognized but may not be a distinct species. In my collection.

Increta Morrison, Proc. Bost. Soc. N. H. 131, 1874. Eastern and Middle States.

Dissecta G. & R., Tr. Am. Ent. Soc. 6, 178. Canada to Middle States.

§*Arctomyscis* Hübn. (1816).

Sperata Grote, Bull. Buff. S. N. S. 1, 81, pl. 2, fig. 1. Eastern and Middle States.

§ *Mastiphanes* Grote.

Edolata Grote, Papilio 1, 153. Arizona.

This is one of the finest forms in the genus. It is larger than *xyliniformis*, shaded diffusely with dead black longitudinally on fore wings, which are cut by the whitish, strongly-toothed t. p. line. The hind wings are white. I have seen a large number of perfectly coinciding examples in Mr. Neumoegen's collection, to whom I am indebted for two types in my own. The tegulæ are shaded with black.

Extricata n. s.

♂ ♀. Hind wings white in both sexes, showing in the ♀ a slight indication of a mesial band marked on costa. Size, large; the ♂ expands 38, the ♀ 46 mil. Very close to *xyliniformis*, but with a fine basal dash; the mark at internal angle obsolete. The t. p. line is denticulate, white-edged, not shaded with black. The terminal black dashes distinct. The orbicular is moderate, ringed, concolorous; the reniform indistinct, shaded with dusky. The t. p. line is thrown out as in its ally. It is to be regretted that M. Guenée did not give fuller details, because there are several species in which the t. p. line is thrown out and the wings long. I have identified *xyliniformis*, which has been reared by Professor Riley, on account of the soiled hind wings of the

♀ and the strong internal dash. Three specimens from Texas, Belfrage. This may be in collections under Guenée's name. The basal dash is very fine, irregular; the tegulæ are edged within with blackish; this form is allied to *edolata*, and is more distinctly marked than *xyliniformis*. Belfrage's numbers are 68 ♂, 699 ♀.

Xyliniformis Guen., Noct. 3, 400; Riley, 5th Mo. Report, p. 126 (larva). Western and Southern States.

Lithospila Grote, Proc. Bost. Soc. N. H. 240, 1874; check list of Noct., pl. 1, fig. 2. Eastern and Middle States.

§*Eulonche* Grote (1873).

Oblinita Abb. & Sm. Ins. Ga. 2, 157, pl. 94. Southern States.

Mr. Thaxter has drawn my attention to the fact that the northern form may be distinct. Although I am not prepared to admit it, and it may be that the larva varies, careful breeding is needed to be quite sure of the name we give our northern species.

Lanceolaria Grote, Proc. Ac. N. S. Phil. 418, 1875. Massachusetts.

Insolita Grote, Bull. B. S. N. S. 1, 82. Pennsylvania.

Under the generic name *Cyathissa*, I would separate the *Bryophila percara* of Mr. Morrison from that genus on account of the notch in the external margin of primaries and the differing proportions, the narrower wings. It is evidently not congeneric with *Lepidula* and the European types of *Bryophila*. I restore Treitschke's name to this latter genus because Hubner's term has been diversely used, and to reintroduce it might cause confusion. I am prepared to surrender every point where a strict enforcement of priority might inure to the detriment of our science. I hope that the anti-Hubnerists will accept the few genera which I have felt obliged to introduce, such as *Lithophane*, which are unobjectionable in every way.

In explanation of my synonymy I draw attention to my corrections of the redescriptions in the "Missouri Reports" of some of our common *Noctuidæ*. No specimens of these were submitted to me for identification, nor am I credited with such work in the reports. I determined *Agrotis scandens* in the first report as a new species, which at the time it was.

Acronycta populi of Riley is Guenée's *Lepusculina;* I made the correction in my earliest list (1873, p. 79). *Prodenia autumnalis* Riley is the corn-bud worm of Abbot, who figured the moth in all stages in the Insects of Georgia. It is figured under Abbot's name of *Frugiperda* also by Hubner. In the Bulletin of the Buffalo Society of Natural Sciences, vol. i, p. 81, this correction is made by me nearly ten years ago. *Xylina cinerea* of Riley is *Lithophane antennata* of Walker. I made this correction in the Bull. U. S. Geol. Surv. vol. v, No. 2, in 1879, assisted by Professor Fernald's identification of Walker's type in the British Museum. I am also of opinion, and have expressed it, that *Amphipyra conspersa* is an aberration of *Pyramidoides*. The identifications of *Subgothica* or *Jaculifera* in the same reports is incorrect, *Tricosa* being illustrated, at least in part (wood-cut). Also "Commelinæ" is not that species. The identifications of our *Noctuidæ* in the Missouri Reports are, generally speaking, unfortunate, and have been made without sufficient acquaintance with the group. Finally, I believe that *Brassicæ* will prove identical with the European *Ni*, and that it may have been introduced like the White Cabbage Butterfly. The peculiar structure of the male seems to be the same in American and European examples. Professor Riley is quite wrong in contradicting my separation of the West Indian and South American *Satellitia* from our *Philampelus pandorus;* my course is latterly approved by Butler, and Dr. Boisduval also considers the two quite different. I have, as early as 1872, in the Trans. Am. Ent. Soc., p. 28, discussed these mistakes.

Since the publication of the list of the species of *Botis* found in North America, Bull. U. S. Geol. and Geogr. Surv., 675, 1878, the following have been described:

Botis commortalis Grote, Can. Ent. 13,233, 1881. Havilah, California.
Botis oscitalis Grote, Can. Ent. 12, 36. Maine; Ohio.
Botis oppilalis Grote, Can. Ent. 12, 36. Maine; Massachusetts.

NOTE.—*Botis dissectalis*, described in the same paper, should be referred to *submedialis*.

Botis dapalis Grote, Can. Ent. 13, 17. California.
Botis lethalis Grote, Can. Ent. 13, 33. California.
Botis vacunalis Grote, Can. Ent. 13, 33. Sierra Nevada, California.
Botis turmalis Grote, Can. Ent. 13, 34. Colorado Rio.
Botis rufifimbrialis Grote, Can. Ent. 13, 34. Massachusetts.
Botis flavinotalis Grote, Can. Ent. 13, 34. Pennsylvania.
Botis annaphilalis Grote, Can. Ent. 13, 34. Havilah, California.
Botis capitalis Grote, Bull. U. S. Geol. Surv. 6, 272. Florida.
Botis fissalis Grote, Bull. U. S. Geol. Surv. 6, 273. New York.
Botis augustalis Grote, Bull. U. S. Geol. Surv. 6. 273. Colorado.
Botis toralis Grote, Papilio 1, 178. New Mexico.

NOTE.—In this same paper I have given a note on *Volupialis*, collected recently by Professor Snow in New Mexico.

BOTIS FLAVOFASCIALIS n. s.

Thorax and base of primaries olivaceous, shading to yellowish. Median field of primaries purple, bounded outwardly by the t. p. line, which is exserted over median nervules. Discal points not discernible without the glass; the reniform indicated by a darker mark. Subterminal space yellow. Terminal space purple, rather wide, of even width. Fringes blackish. Hind wing sub pellucid, pale, with fuscous terminal line and line at base of pale fringes. Beneath legs and body pale, the wings faintly reflecting upper surface. New Mexico, Prof. Snow, No. 876.

Expanse 21 mil. This form is easily recognizable by the clear yellow subterminal field, contrasting with the broad vinous terminal space and the purple median field projected over median veinlets; above the exserted portion of t. p. line the subterminal space is narrower. It resembles *onythesalis* in disposition of colors on fore wings, but the purple terminal field is wider; the hind wings are discolorous, the colors of primaries more intense, and defining clearly the separate fields of the wing. The colors are darker than in *laticlavia* or *cinerosa*.

BOTIS WASHINGTONALIS n. s.

The shape is like *fodinalis*, apices produced subfalcate, pointed; bone white or soiled whitish, sprinkled with fuscous; wings broad. A fuscous apical shade; corta fuscous to reniform. T. p. line formed of little scallops, with a sulcation below median vein. A fuscous shade extending to costa over reniform spot. Anterior line angulate. A square, partly open spot just beyond the line and remote from the reniform, the orbicular. Preapical costal dots. A distinct series of terminal dots on both wings. Hind wings concolorous; an incomplete line, distinct beneath where is a discal point, and one beyond it, near the base and costa. Markings beneath distinctly repeated; the spots on cell of fore wings distinctly filled in with fuscous. Length of fore wing, 14 mil. Three specimens. Washington Territory. Mr. Morrison

Art. XX.—New Moths, principally collected by Mr. Roland Thaxter in Maine, with notes on noxious species and remarks on classification.

By A. R. Grote.

While Pennsylvania and its chief city, Philadelphia, hold classic ground which has witnessed the labors of the early writers in America on Entomology, such as Haldeman, the elder Le Conte, Melsheimer, and Say, Massachusetts and Boston are no less to be remembered, with Cambridge, where Harris collected and wrote. In fact most of the older States had their entomologist, not a "State entomologist," but some one who made himself felt in the then small but growing literature of our science during the first half of the present century. Randall in Maine; Kirtland in Ohio; Drs. Morris in Maryland, Fitch in New York, Leonard in New Hampshire, are instances that occur to one in writing. Nor will Jaeger, D'Urban, and Oemler be forgotten, or Peck, to whom Harris was indebted for early inspirations. From early sympathy, rather than association, I have belonged to the eastern circle of "enemies of the net." I have wandered along the lanes of Cambridge, about the university grounds and again walked the paths of Boston Common, beneath the elms, *sub tegumine ulmi*, before I grew to man's estate, and conjured up the figure of Dr. Harris studying *Ceratomia*.* I could never think of Dr. Harris as "furtively boxing" his captures. There was something quiet and earnest bound up with my idea of the man and his work, which precluded the notion that he cared for what might be thought, by passers-by, of his occupation. Yet he must have been unobtrusive, if not timid, by nature. Still less can I think of him armed, *cap-a-pie*, like the modern or English collector. I supposed then, and still think, that few noted his going and coming, on those walks which furnished facts for his letters to the Rev. Dr. Leonard or to Doubleday. He seemed to me to have been very different from Say, a slower and more careful man, equal to his state. An unattractive hero, perhaps, with the same conservative ideas as the mass of his fellow-townsmen. Yet, to me, he was greatly worthy of veneration, and I was undecided whether he were the

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*The odd way in which "H", for "Harris," was afterward turned into a contraction for "Hubner," I have written about elsewhere. Dr. Clemens made no original compilation of the literature of the *Sphingidæ* in his "synopsis" of that family, and Dr. Morris only copies Clemens.

more remarkable, or Thoreau by Walden Pond. Thoreau and his school stood outside of Evolution, and the Derivative philosophy of nature; and it surprises one that it should have been so. With his knowledge of the classics, it is strange that Thoreau overlooked Democritus and Lucretius. The facts all ran before his eyes, and he took them up singly, as the bit of sky on the blue-bird's back; but he went no further with his discovery. The New England blue-bird, or its Mayflower bloom, stood in relation with some fact that was true by the banks of the Ganges, for Thoreau. He fitted them into some eternities reflected from the Bhagvat-Gheeta; meanwhile they were fading with the season and fighting the struggle for existence in the Concord woods. Nature has to be studied from small point to small point. Thus are the fine chains of reasoning made, which, presently, some one will cast over the Rocky Mountains and bring down a land-slide of results—so much of the world captured. Thoreau threw aside all his weapons and refused this world's fight. He was a poet of Nature because he did not understand Nature; she was perpetually strange to him. Matter was the miracle for Thoreau; Mind the every-day affair. He was satisfied when his thoughts had untied themselves and fled from the matter which gave them birth. He admired their tenuous appearance, far off and disappearing, following the doves behind the clouds. But meanwhile Dr. Harris was finding the curious larvæ with horn-like ridges on the thorax, which were feeding on the elm trees of the Common. He knew that this was a remarkable variation of the usually smooth Sphingid larval form, something "not in the books." He called the insect *Ceratomia*, and *put* it in the books, where it must stay for future generations to study over. This is some of the philosophy of facts that must be pursued to discover the succession in place and time. Thoreau stood aloof from it; by so much superior to the eternal procession, and yet by so much the loser and out of sympathy with humanity and the direction where its inquiry and progress were to lie.

By a good many threads of thought Entomology attaches itself to general literature. I remember reading in Dr. Fitch's "Reports," his speculation that the "great caterpillar" of Indian tradition, sung of by Longfellow in "Hiawatha," was that of *Euprepia americana*, an insect now thought to be identical with the European *Caja*. But the description does not fit that species nearly as well as it does the black, hairy caterpillar, with its deep scarlet rings, of *Ecpantheria scribonia*. This is commonly found in the spring, pupating beneath logs and stones in May and June. If, indeed, we are to take the name literally, the strictly American genus *Ecpantheria* seems more appropriately to be noted; and, as its larva is, probably, the handsomest and most striking of its group, it would not unlikely catch the eye of the Indians.

I can fancy how long Entomologists will be glad that Dr. Harris lived, as I have every day since I knew it. It is not only his excellent English, his staid, unflippant style, that makes his "Report" so readable. It is the spirit of cultivated observation that pervades his page and makes it young and modern always. Perhaps not so much modern, as alive and quite well. Some of us are not so well, with the printer's ink hardly dry. Professor Riley finds some fault at my quoting Dr. Harris's original "Report"; but for all these reasons it is a favorite "Report" with me, although I do not think the descriptions of *Noctuidæ* in it are accurate enough, or full. As to this fact, the early descriptions are all scant, while the known kinds are still few.

The Eastern Entomologists are, I believe, all fond of Harris's memory, and he seems to have left behind him a good reputation. The Boston Society published his Correspondence, and this is very readable. From a scientific view the new names for Moths in it, all poorly founded, should have been omitted from the book. It was a mistake to publish them without the specimens at hand and some one to tell the editor what they now were to be called. The resurrected names, I fear, are not only past reviving, but past recognition.

My old leather-backed "Report" is now the book I most often take down, open, and read. I do not see what I could have done without it, when I only had the more gorgeous Flint edition. My copy was once Dr. Fitch's, and will be some one else's in turn. I hope my true kin, the entomologists, will keep it going from one to another down the coming years. It contains also the "Descriptive Catalogue" from Silliman's Journal. Dr. Harris has written the date, 1839, on its title page; an "extra" title page, evidently. It is an "Author's copy," bearing above, also in Dr. Harris's handwriting, "Asa Fitch, from the author." One of those "extras" which the Rev. Mr. Hulst appears to think does not constitute publication, as against the "number" of an amateur antedated. It is paged by itself, but on the reverse of the title, on the second page, Dr. Fitch (I think) has written: "p. 282, in Silliman's Journal, vol. 36."

As illustrating the uncertainty which one often feels, whether the position given to an aberrant form is the true one, I may cite a written remark, in my copy, to the description of *Psychomorpha epimenis*, on page 39. Dr. Fitch has written in ink over Dr. Harris's own words in lead pencil: "A Noctua, genus *Brephos?* (Harris's correction)." But we know that this is, in effect, no correction, and that the insect was properly named at first. Some time I may give more notes on this copy of Dr. Harris's "Report," &c. It is no wonder I am fond of the book. It is nicer than many of the later "Reports," which I occasionally receive, on its subject; although our information on "Noxious insects" is, to-day, so much fuller, more practical, and thus more valuable.

All specimens of Moths from the Eastern States bring up thoughts of Dr. Harris and, indeed, the great thinkers of the region whence they come. Undoubtedly the face of the country, its fauna, flora, and climate, influence its productions, its learned men among other. So there is nothing inconsequent in my digression, which I leave to consider the specimens before me, and which have been chiefly sent by my friend, Mr. Roland Thaxter, making part of his collections.

Ichthyura strigosa n. s.

♂ ♀. Allied to *americana* of Harris. The pre-apical stain is yellowish; the white mark curved and rather even and narrow. Lines much as in allies. This form is distinguishable by a succession of short blackish interspaceal dashes, situate subterminally; one, opposite the disk, extending backward to the middle of the cell, and two shorter, on the succeeding interspaces above it; there is also a blackish mark below, between veins 3 and 4. The dark fringes finely cut with pale. Hind wings fuscous. Beneath the blackish streaks reappear. They distinguish this form, of which Mr. Thaxter has reared several specimens, from larvæ found on Poplar, at Kittery Point, Me. The thorax is marked as usual in this genus.

Agrotis gularis Grote.

Mr. Thaxter has taken *turris* and *gularis* in *coitu*; thus my former suspicion that the ochery *turris* was only a variety of the dark red *gularis* is verified. The latter seem to be usually the males. Kittery Point, Me., and Newtonville, Mass.

Agrotis dapsilis n. s.

Whitish-gray. Forewings rather short and broad. Thorax thickly haired. Eyes naked. Forewings and thorax whitish-gray. Inner median line represented by black dots on the veins. Orbicular a minute dot. Reniform a narrow, blackish, curved streak. T. p. line dotted. S. t. space a little darker on costa; s. t. line a dark, faint, uneven shade. A dotted line before the pale fringe. Hind wings pale fuscous gray, with a darker fuscous shade band before the margin and faint mesial line. Beneath, hind wings whitish; forewings fuscous with obliterate markings. Florida; Mr. Thaxter.

Hadena misera n. s.

This species, with naked eyes and unarmed tibiæ, has a slight, discolorous, thoracic crest, and the dorsum of abdomen is feebly tufted. It has the appearance of *Perigea luxa*, but is smaller, more compact. Of the same fuscous color, dark, and with inconspicuous markings. The reniform moderate, discolorous, yellowish, the other stigmata hardly indicated. Lines lost, except the waved, rusty yellow subterminal. Costa dotted with pale yellowish. Hind wings nearly concolorous dark fuscous, paler than forewings. Beneath, fuscous; hind wings paler, irrorate, with dot and extra mesial line. The head, collar, and tegulæ, blackish fuscous, like forewings. Abdomen like hind wings. The disk of thorax somewhat rusty and paler. Illinois; also, I have somewhere seen a specimen from New York. Apparently not common. August.

Perigrapha transparens n. s.

♀. Eyes hairy. Tibiæ unarmed. Vestiture of the body rather shaggy. Abdomen untufted. Thorax with a ridge down the center. Head a little sunken. Apex of primaries sharp; outer margin lightly curving in below apices; full inferiorly. Russet-brown, somewhat thinly scaled on the wing. Forewings reddish brown, nearly concolorous; reniform a vague black shade. Lines wanting. The veins are a little marked with black in place of t. p. line, and show exceedingly minute pale dots terminally. Hind wings subdiaphonous, fuscous. Thorax and head like forewings. Outline of *normalis*. Secondaries with the hind margin indented subapically; beneath with discal dot. The color beneath is uniform, reddish fuscous, with veins marked on both wings. Washington Territory. In my Collection. In form the relationship to the Californian *erythrolita* is evident.

Tapinostola orientalis n. s.

Size smaller than *Senta defecta;* wings narrower; apices somewhat blunt, yet determinate. Eyes naked. Abdomen (of the female) short and plump, untufted. Head close to the thorax, roughly haired; labial palpi somewhat dependent. Clypeus smooth. Forewings of the usual heliophiloid tints. Veins pale. Subcostal and median veins lined within on the cell finely with black. Submedian interspace above the fold pale yellowish. T. p. line indicated by a black dot on submedian fold, a smaller one between 2 and 3, and faint traces of others superiorly. A fine, black terminal line cut by the whitish nervules. Hind wings lighter at base, pale, with a light fuscous terminal shade; extra-mesial line indicated. Beneath, without markings, pale; a dot on hind wings; veins marked. Two specimens, Kittery Point, Me. Collection of Mr. Thaxter. This cannot be *variana*, on account of the dotted t. p. line.

Nonagria subflava Grote.

A specimen agreeing with my type, but a very little smaller, has been taken by Mr. Thaxter at Newtonville, Mass. My type is from Northern Illinois.

Scopelosoma moffatiana n. s.

This species, captured in the autumn on oak leaves by Mr. Moffat, of Kingston, I have formerly regarded as the same as *graefiana*. Mr. Thaxter thinks it is different and calls my attention to the following points: It is generally larger; more richly colored, being of a reddish-orange, while *grafieana* is yellow. The transverse lines are blackish, not red, and more uneven; the t. a. line arched in *moffatiana*. The hind wings are suffused with red in the new species, and I find that the mesial line is more even. Taken with *ceromatica*. Mr. Moffat has captured many rare Lepidoptera; among the Noctuidæ, I note especially *Arzama diffusa*. I have supposed that *moffatiana* was fresh, autumnal, *graefiana*, and figured it as such in my essay, incorrectly.

This discovery that the type of *graefiana* is the Fall form, and that it is always to be distinguished from *moffatiana* by its yellow ground color, red lines, which are also straighter and, perhaps, thicker, as well as the paler hind wings, leads me to recall all the instances where I have erred in my estimate of varietal characters in the group. I find that I have made almost as many mistakes one way as the other; thus I feel sure that there is not an overplus of "species" as the names stand in the books. There are a few varieties still held distinct in all probability, such as *gentilis* and *perbellis*, *evicta* and *vomerina*, but the proportion of such cases is very small indeed; and it must be remembered that even in Europe, where they have studied the fauna so much longer and more carefully, discoveries affecting the standing of certain forms are yet making.

Platysenta angustiorata n. s.

♂. Eyes naked. Body linear, narrow, slender; abdomen a little flattened, untufted. Front without projection. Labial palpi exceeding the head; second article squamose; third rather long with appressed vestiture. Wings silky. Forewings fuscous gray, darker terminally. A basal blackish dash below median vein. One on the cell before the small reniform, which consists of two black points ringed with pale. Lines wanting. Legs unarmed, concolorous with the rest of the appendages and body. Hind wings pale at base, with broad blackish terminal band. Beneath both wings with broad black borders. Colorado. This species cannot be a *Caradrina*, from the well-sized terminal article of the labial palpi. It is about the size of *atriciliata*, differing in color, but like it in the ornamentation, or rather want of it. I cannot believe that Guenee's *videns* is *atriciliata*. The insect is like a *Caradrina*, but not agreeing with *Leucania*. The slender form, naked eyes, etc., should prevent any idea that in *Platysenta* we have to do with a noctuid related to *Heliophila*. It will, I think, be found that the genus comes nearer to *Caradrina* than any other.

Anchocelis digitalis n. s.

Size small. Wings entire; apices pointed. Head, sunken, hairy. Eyes naked; strongly lashed; somewhat ovate or narrowed. Tongue not as strong as usual. Front with a transverse elevation. Legs with the tibiæ unarmed, pilose. A neat, compact noctuid, with the ornamentation not unlike *Tæniocampa modifica*. Bright brown. The median space darker, contrasting, v-shaped, confined by the two pale, narrow, even, median lines, converging to internal margin where they nearly meet; stigmata obsolete. The reniform alone discernible; figure-of-8 shaped, made of two dark spots, annulate with pale. The wings are a little silky. Hind wings blackish, with paler, brownish fringes. Anal tuft brownish; beneath paler, with double common lines and discal marks on both pair. Orono, Maine; Mrs. Fernald.

This beautiful little noctuid differs in the pointed primaries from the genus *Anchocelis*; it agrees in the naked, lashed eyes, and in having a clypeal protuberance. It is related to the genera about *Tæniocampa*. The body is rather shaggy, the thorax is straight-haired, and there seems to be a slight tuft behind the collar. While the clypeal projection does not accurately correspond to the structure of *lunosa*, as given by Lederer, still I know of no genus where the bright-looking and distinctly marked species is better placed for the moment. The abdomen is not tufted; it exceeds the hind wings. The antennæ are simple, ciliate. The absence of all distinct lines or marks on primaries, except the two median lines inclosing the darker V-shaped median space, should make the species easily recognizable.

Plusia surena n. s.

Allied to *ampla* and *epigæa*. No reddish or brown stains. Forewings whitish gray and black, silky; t. p. line rivulous, without prominent indentations. Metallic mark an open V; the outer limb a little uneven, silvery, narrow, surmounting a black patch or shade filling the median field below. S. t. line preceded by a black shade, a little irregular, black. Reniform upright, black-ringed, not constricted. Orbicular small, oblique, finely ringed. Hind wings yellowish fuscous, rather pale, with a moderately broad terminal band. Thorax gray. Orono, Maine; Mrs. Fernald's collection.

I am much indebted to Mrs. Fernald for specimens of moths from the neighborhood of Orono, collected with great care by herself. The fauna of Maine is of exceeding interest. Not only is it the home of three such rarities as *Platysamia columbia*, *Eusmerinthus cerisyi*, and *Catocala coelebs*, but several species occur there originally described from the Pacific coast, such as *Agrotis atrifera* and *Botis fodinalis*, while *Syneda alleni* has been recently again described from the West as *saxea*, as Mr. Hy. Edwards informs me. Space does not allow me to write further on the subject, but local lists from Orono will be among the most interesting from any locality, as is evident from Mrs. Fernald's captures, upon whom the occupation of the entomologist sits charmingly.

The families of Moths catalogued in my "New Check List" I am disposed to consider of equivalent value, yet the tendency among students of the suborder has been to increase the number of family groups. It must be admitted that the lower subfamily (*Glaucopes*) of the *Zyganidæ* is closely allied in structure to the *Arctiidæ*. The errors of Dr. Boisduval and myself in certain instances show the fact. In the larval state Dr. Packard has discussed the points in which *Ctenucha* approaches *Arctia*. The effect of limiting the family groups by certain single characters has led to the breaking up of the *Bombycidæ* into family groups, which destroy the unity offered by points of form. We have now such speculations as that of Mr. Butler to consider as to the affinity of *Cossus* with *Castnia*. For my part, while I strongly urge the importance of founding the genera on absolute characters of structure, I would be led by considerations drawn from the criteria of rank in Hexapoda in deciding the relative position of family and subfamily groups. The long and heavy abdomen is decisive, I think, of the low position and mutual relationship of *Cossus* and *Hepialus*, within the *Bombyces*. We have surviving in this group a number of types now comparatively isolated; in arranging them we must be governed by general considerations of this kind. The relationship is net-like, and the survival is unequal. The Notodontians may be held to be nearer the *Noctuidæ*, but I should not arrange them last on this account; if, by position, we indicate a higher or lower structure, we are bound to finish the *Bombyces* with the *Hepiali*, with naked larvæ and short antennæ in the moth. Nor can I, on account of the hairy larvæ, place any of the Apatela-like genera of the *Noctuidæ* among the *Bombyces*. I have explained the characters which have influenced my arrangement of the genera of *Noctuidæ*. There is a general tendency in the increasing breadth of wing and common coloring of both wings towards the Geometrid type. To a certain extent the sequence is broken by the Deltoids. Yet the higher genera of this group are not separable by structure from the lower forms of the *Fasciatæ*. It needs only the comparison of *Homopyralis* and *Pseudaglossa* to show this. On the other hand, the limit between the lower Deltoids and the *Pyralidæ* is difficult to define; certainly, I have been puzzled to locate such a genus as *Derectis*. The neuration must guide us; yet how uncertain this character often is, has already been felt by observers. The result of my own studies has been to insist on the present sequence of the families, interpolating the *Geometridæ* between the *Noctuidæ* and *Pyralidæ*. As to the genera, I would keep the Apateloid genera in the *Noctuidæ;* from which family I think it also unadvisable to separate the *Cymatophorina* of Herrich-Schaeffer. In studying a species with the view of locating it in any family, we must be guided by the relative form and, as shown by Dr. Packard, the *facies*, in addition to the balance of single structural features. Such consist in the structure of the eyes, antennæ, mouth parts, neuration, and genitalia; the presence of ocelli, the character of the vestiture, the pattern of marking and color must be ascertained. After all this, a certain tact, which is the result of experience, must be depended upon to successfully place the species. A special discussion of the different forms catalogued by me would be too lengthy and out of place. I would merely endeavor to interest the reader and lead him to investigate the many questions which are not finally answered. The time is coming when our classifications will be greatly influenced by a knowledge of extra-limital forms. The student of a group as represented throughout the globe must be relied upon to place correctly the species in a single fauna. For this reason MM. Boisduval and Guenée have been, and now Mr. Butler and Professors Speyer and Zeller are, in the best position to give a weighty opinion. The *Sphingidæ* of the world in the cabinet of the British Museum afford their describer many facts which influence the arrangement of the North American species. It was not without a survey of this and other large collections that I adopted the present arrangement of our forms. I was glad to find that our earlier Synonymical Catalogue offered main points which Mr. Butler could accept, when he considered the Sphinges from all the continents.

Of the few changes made in my "New Check List," I find space to notice my reference of *Crocota* to the *Arctiidæ*, based on the presence of ocelli and the structure of the larva described by Mr. Saunders. Again, Dr. Bailey has drawn attention to the characters of *Cossus centrensis;* in doing so the structural differences offered by *robiniæ* become apparent, and justify a different name for that species and allies. In the *Sphingidæ* I have taken Dr. Boisduval's term for our genus, of which *gauræ* is the type, Mr. Butler having shown that *Proserpinus* is untenable. If we divide *Sphinx*, as now restricted, we may use Hübner's terms *Lethia* and *Agrius*, for which, in my list of 1873, I have proposed types included by Hübner. But it seems to me difficult to find sufficiently strong characters, and I have left the genus undivided, with *ligustri* as type. The European *convolvuli*, on the other hand, I would refer to *Phlegethontius*. The changes in the *Noctuidæ* have almost all been made originally in other papers. I have reduced the number of species and genera as much as possible. Both the moth of *Platycerura* and the larva, observed by Mr. Thaxter, offer characters which appear to me to warrant its location with the *Bombycoid Noctuidæ*, such as *Charadra* (an American genus distinct from the European *Trichosea ludifica*, and *Audela*, and not with the Notodontians. On the other hand, *Edema* seems to me to be decidedly a Bombycid, although it has been suggested that it belongs to the *Noctuidæ*, by European authorities. Among the curious resemblances between the lower *Zygænidæ* and the *Arctiidæ* is the similarity between *Ctenucha* and *Euchætes*. The stone-gray or mouse-color of the wings of the darker *Euchætes* forms, such as *egle*, recalls *Ctenucha*, and the red stripes of *Spraguei* and the yellow of *abdominalis*, though not similarly placed, remind one of the ornamentation of certain forms of *Ctenucha*. It is owing to a coincidence of outline and color that I believe I made an error in describing *abdominalis* as a Zygænid, a good many years ago.

The study of the *Noctuidæ* gives important hints as to the derivation of species, to which I have called attention by the method of variation between "representative" species, and the fact that the larval stage affords evidence here and there of independent modification. The larvæ of *psi*, *tridens*, and *occidentalis* all differ, while the moths are much alike and, perhaps, cannot be separated always with certainty; yet the American form differs apparently a little more than do the two European ones, occupying the same territory, from each other. All cases of imagos differing but slightly must be held as showing a closer relationship, a nearer epoch of disintegration in time, than is expressed by generic association. We have no name for such groups of individuals, intermediate between species and varieties, not forming *genera*, as we now understand genera to depend on similarity of structure alone. As usual, in a multiform and plastic group, like the *Bombyces*, whose blood we can trace in groups like the Glaucopidians, which we now separate from them, the difference having grown to be a large one, we shall find more clearly proofs of such a condition of groups of individuals. I propose to call them *Progenera*. An example is, for instance, *Dutana;* also *Ichthyura*, *Nadata*, *Clisiocampa*, *Orgyia* (and *Eucronia* as a division of *Hemileuca*, if we are obliged to admit *Neumœgeni* into *Hemileuca*, as I believe). Other instances will occur to the student. The species of such *Progenera* stand in a nearer connection than usual; with some of the forms the interbreeding may not have become suspended. In the butterflies *Grapta* and *Basilarchia* (I use this term for the American *Eros*, *Arthemis*, *Proserpina*, *Ursula*, *Dissippus*, excluding the Californian forms, and thus, perhaps, as a division of *Liminitis*) are instances of Progenera. *Subgenera* are smaller assemblages of species in a genus, agreeing in some minor peculiarity of structure. They are not groups of coincident forms varying less among themselves than is the rule with "species," while yet not "varieties," being more distinct and true. In the study of such groups, particularly in that of *Basilarchia*, as I have elsewhere pointed out, lie immense possibilities in the direction of ascertaining the causes of so much diversity in the *Lepidoptera*.

INSECTS INJURIOUS TO VEGETATION.

Eugonia subsignaria Hübner.

This whitish Geometrid used to be so common in Brooklyn, when I went to school there in 1857 and subsequently, that the horse-chestnuts, elms, and maples, the latter especially, became completely defoliated, and the brown measuring worms used to hang down and cover th sidewalks, ultimately to the great discomfort of the passers by. I hav seen ladies come into the house with as many as a dozen of the worms on their skirts and crawling over their clothes. Nervous persons wer much frightened in discovering the disagreeable-looking but harmles caterpillar on their garments. At the same time the worms of *Alypia* 8-*maculata* and *Thyreus Abbotii* were very common on the grape vines. Also the larvæ of *Deidamia inscripta*, *Eudryas unio*, and *Chamyris cerintha* were common. In New York, as well, some trees about the old Post-office, on Nassau street, were similarly affected by the larvæ of *E. subsignaria*. The advent of the English sparrow changed all this. Th naked brown larvæ of *subsignaria* disappeared before them. Gradually all the other naked larvæ became scarce or disappeared. *Orgyi leucostigma*, with its hairy uneatable larvæ, became more common. I Buffalo, where this was always common and the naked larvæ were rar or unknown, the English sparrow did no good as a destroyer of th caterpillars on the city shade trees. When I lived in Amity street Brooklyn, about 1859, I remember to have found on our small grap vine, in the contracted back yard to the usual brown-stone house, th larvæ of most of the species here mentioned, as well as *Everyx chœrilu* and *myron*, so plentiful was insect life before the English sparrows came. *Thyreus Abbotii* was so common that its large larvæ could be found almost by the hundred. The native birds were undoubtedly diminished by the attacks of domestic animals and boys, to allow of such a multiplication of caterpillars. I think those were golden days for the Lepidopterists, looking back on them now. How much their brightness in retrospect owes to other causes, in my own case, is a matter of trite philosophical inquiry and conclusion.

LARVÆ AFFECTING THE PINE.

Citheronia sepulcralis Grote.

This large moth was found on the yellow pine, in the larval condition, by the late Mr. James O. Treat, in Massachusetts. On an unpublished plate, painted by Abbot, the moth is represented, but not the earlier stages of the insect. This plate is in the British Museum Collection. The moth has been reared in numbers by Mr Koebele in Florida. In all stages it is as distinct from *regalis*, as any two forms in one genus can possibly be. I notice it here, to correct a remarkable statement by Dr. Packard in his excellent and very useful Report on Insects injurious to Forest and Shade Trees, that it may be a variety of *regalis*. It has been found not uncommonly about Atlanta, Ga., and, I believe, on small persimmon bushes as well as the pine. Specimens reared by a collector there, were forwarded to a well-known collector of Reading, Pa. There can be no doubt that the species are abundantly distinct. I collected a very few *C. regalis* larvæ about Atlanta on the cotton plants. The two larvæ differ on comparison; that of *regalis* is differently colored, larger, and with longer horns. In my opinion there is no doubt of their distinct character.

Tetralopha diluculella Grote.

This species infests the terminal twigs of the pine in its larval state. Professor Comstock gives a description of the larva and pupa collected in Florida on *Pinus tæda*. The insect is found as far north as New York. I have given a scientific sketch of the group to which I refer this species and its genus. It is a new subfamily of *Pyralidæ*, which I call *Epipaschiæ*, after the typical genus founded by the late Dr. Clemens. It is chiefly characterized by a basal tegumentary extension to the male antenna.

Pinipestis Zimmermani Grote.

I have described the larva and moth of *Pinipestis Zimmermani*, Grote, in the Bulletin of the Geological Survey, Vol. IV, No. 3. The genus may not be distinct from *Dioryctria;* but the European moth has not the raised scales on forewings, and the neuration varies somewhat. I dug out from pine trees these larvæ in the winter; and at different times Mr. Zimmerman, of Erie County, New York, who first drew my attention to the insect and for whom I named it, brought me specimens.

These were pinkish compared with the larvæ I found in June beneath the gummy mass of exuded sap, and which pupated in July. I could not carry the winter larvæ through, but they are undoubtedly the same species. Professor Kellicott, I believe, at first doubted this, but afterwards came to my original opinion. The species is, then, single brooded. It is very destructive and spreads in nurseries among imported pines. As it affects the branches and is protected by the gum, I do not think that anything can be done except digging the larvæ out with the knife, which is tedious and, except under peculiar circumstances, an unprofitable and difficult process.

LARVÆ AFFECTING THE HICKORY.

Phycis caryæ Grote, Papilio I, 13.

This species was discovered by Mr. Coquillett, of Ill. The larva burrows into the branches of the pignut hickory, *Carya porcina.* "The larva spins a thin web around the footstalks of the leaves which grow near the terminal end of the branch, and then burrows into the terminal bud and wood of the first year's growth."

Phycis angusella Grote, North Am. Entomologist I, 51.

This species has been reared from larvæ boring into the leaf-stems of the hickory on Long Island by Mr. Akhurst. The specimens of the moth which I have examined proved to be all males. It may be known by the continuous black dash on the under side of hind wings along costa. I use the typical generic term *Phycis* of Haworth for the species formerly separated under *Acrobasis.*

Phycis demotella Grote, Papilio I, 14.

This moth, of which I only know the male, and not as yet the larva, has a shorter black mark on secondaries beneath, not connected with base of wing, and a narrow streak on median vein. Head and thorax pinkish white, as also base of wings. Taken with *angusella* at West Farms by Mr. James Angus. I think the larvæ feeds on Hickory.

LARVA AFFECTING THE LOCUST.

Salebria contatella Grote.

This species was bred from larvæ found on *Robinia pseudacacia*, in the Department of Agriculture grounds at Washington. It draws the leaves together, the side of one to that of another, according to Professor Comstock, in whose valuable report for 1880 an account of the insect will be found, p. 261, *et seq.* The variety 5-*punctella* was also bred from the same larvæ. This variety seems to arise, as I have stated, by the outer line of the t. a. line, becoming resolved into dots. My figure, in the Am. Ent., is the least exact on the plate, the figures on which, otherwise, were accurately transferred to the stone and finely engraved upon it.

LARVÆ AFFECTING THE CABBAGE.

Plusia dyaus Grote.

This species has been reared from larvæ found on cabbage. I have seen no account of it, however. I believe it will be found on other plants more commonly and not principally on cabbage like *Plusia ni*, a European form of peculiar structure, which I think may have been introduced into this country much as the White Cabbage-butterfly. Although the American specimens have been described as distinct, I regard them as the same as the European species.

Botis repetitalis Grote.

Specimens of the larva of this species were received by Professor Comstock, when Entomologist to the Department of Agriculture, from Dr. A. Oemler, of Savannah, found feeding on cauliflower. It is described on page 270 of the report for 1880, which latter is one of the finest and most scientifically valuable documents ever issued by the department, of which I have any knowledge.

Geometridæ.

After comparing European specimens with our own, I have made the two following changes in our lists:

Glaucopteryx Inventaraia, Gr.
Gl. Cæsiata ‡ Butler, Papilio I, 222.

Scotosid Indubitata, Gr.
Sc. dubitata ‡ Harvey, Bull. Buff. S. N. S. I., Pl. XI, fig. 7.

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